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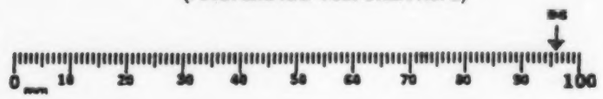

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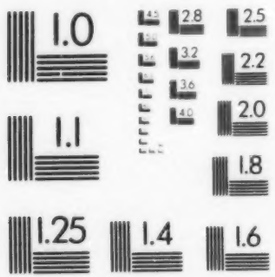

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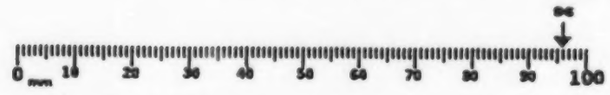

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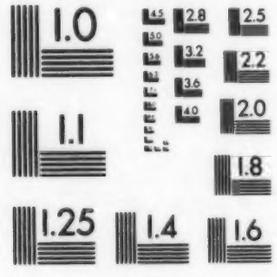

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A Provincial Government Profile

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Alberta
ENERGY AND
NATURAL RESOURCES
Energy Conservation Branch

Energy CONSERVATION

Energy conservation is a concept and a practice which increasingly involves us all. This booklet provides a brief outline of what the Alberta Government is doing about energy conservation and how it affects us.

Many of us relate the term energy conservation to changes in our life styles. But more appropriately it refers simply to good energy management — a process of reducing unnecessary waste, saving money and often increasing levels of comfort.

For decades, supplies of cheap energy lulled us into a state of indifference about good energy habits.

For despite the relative abundance of energy resources in Alberta, higher prices and dwindling supplies of inexpensive conventional forms of energy are having their economic and social impacts on Albertans.

Obviously, the current problems will not just go away. Higher prices cannot be blamed entirely on foreign cartels and political decisions. Indeed, current prices reflect a high demand for a dwindling resource, and many alternatives are too costly, environmentally unacceptable or technologically impractical at this time.

This bank of pumpers is part of a heavy oil project. Dwindling supplies make such expensive projects necessary, and higher prices make them possible.

Equally obviously, we can't stop using energy. Our life and work styles may be derived in part from our assumption of cheap, inexhaustable energy, but going back to a semi-technical society is unacceptable and unrealistic. While miracle-working, energy-saving technologies may be glimmers on the horizon in the future, they certainly aren't available at the supermarket today.

More efficient energy management, or energy conservation, means more efficient living and more economical living — two important reasons why the Alberta Government has a major

commitment in this area. Indeed, 22 provincial departments and agencies have specific conservation programs.

The government's first responsibility in this area involves energy production. It is the role of the Energy Resources Conservation Board to conserve Alberta's energy resources by regulating their exploration and production and setting policies for their orderly development and management in the best interest of the people of Alberta.

By requiring efficient production practices, the ERCB endeavours to give our resources the longest lifetime practical.

The Board estimates the reserves and the productive capacity for each type, appraises energy demands in Alberta and outside markets, and collects and publishes statistics on Alberta's energy resources.

Large energy users must demonstrate that they will use energy efficiently before the Board will issue an Industrial Development Permit.

But conservation affects everyone more directly in terms of consumption, and to this end government conservation practices are exercised in three general ways:

I By setting an example in its own operations.

II By providing assistance and advisory programs.

III By sponsoring research into more efficient and alternate energy uses.

I By setting an example in its own operations.

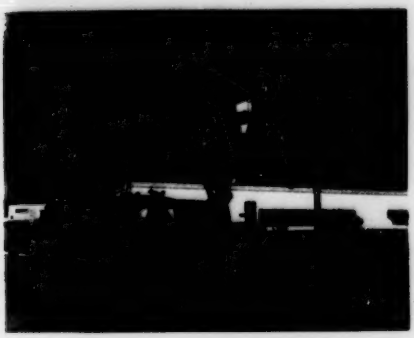
A prime area where the government can set an example, is in the efficient energy management of government buildings, where major energy savings are possible in air conditioning, heating and lighting systems. Efficiency programs in these areas operate on three basic levels:

1. More efficient use and management of energy in existing facilities.
2. Technical renovation or retrofitting to provide better efficiency and control.
3. Design of new energy efficient buildings.

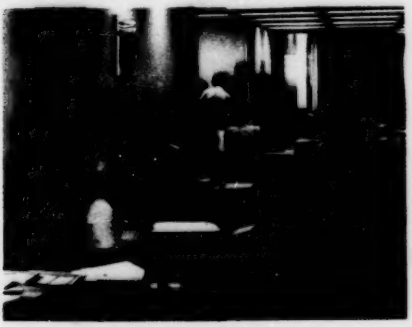
Government Services is the department responsible for the operation of all Alberta Government owned buildings.

Established by government policy in 1976, one of its objectives is to reduce energy consumption for each building without adversely affecting their function.

The initial short-range program included shutting off air handling units where practical during weekends and weekday off-hours and reducing lighting levels.



Outdoor lighting, while attractive, is costly. Consequently, perimeter and parking lot lighting was made more efficient and reduced to the lowest level consistent with safety and security.

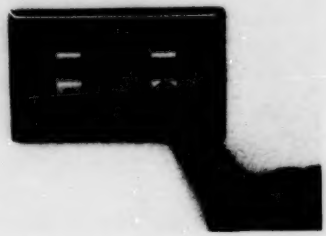


In many modern office buildings, lighting is of high intensity which bears little or no relationship to the tasks performed.

For heating, ventilation and light management, an initial long-range program has commenced.

The Department developed energy consumption performance indicators for all buildings which show the annual energy consumption per unit area. Future energy reduction

By adjusting light to the task performed, general levels were reduced. Lighting in corridors, storerooms was reduced even more.



A campaign encouraged shutting off lights when areas were not in use.

Automated building systems control and data bank at the Terrace Building, Edmonton, are part of a standardized monitoring program. Monitoring helps to identify areas of potential saving and to develop an energy budget.

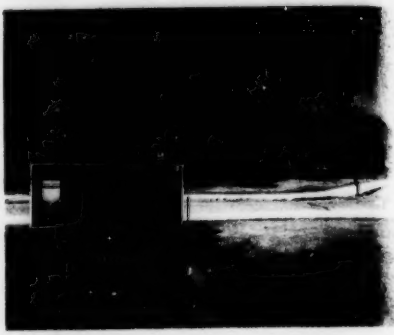
will be based on the individual building performance indicators and energy consumption budgets during the past two years. Computer simulation programs may also be used to develop energy budgets.

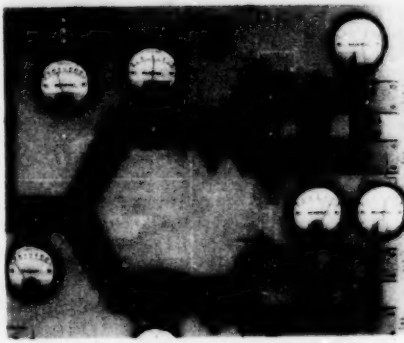
To date $1.7 million has been spent on the program, resulting in savings of $3.5 million from 1977 through 1979. Continuing success rests with the enthusiasm of the people affected. Hence a training program for maintenance staff has been developed and building occupants have been made aware of their role in the over-all effort to conserve energy.

New buildings, of course, offer many opportunities for planned energy efficiency.

Public Works personnel use data from existing buildings to help them design more efficient ones.

Based on analysis of long term statistics and on pilot studies, Alberta Housing and Public Works developed a design manual which outlines requirements for and assists in the design of new buildings and, in some cases, the redesign of existing buildings.





In 1977 Public Works and Government Services designed a central computerized installation for automating the operation of the Northern Alberta Institute of Technology. The system has been operating since 1978.

Much of the manual is directly related to energy conservation, and one section specifically sets out target performance levels in terms of energy consumption per unit floor area per year.

Through in-house computer analysis of building design proposals, architects and engineers are assisted in meeting specific and economical energy budgets in all new buildings.

Buildings housing Alberta's universities and colleges come under the jurisdiction of the department of Advanced

Education and Manpower. These institutions have long been involved in energy conservation, not only by developing materials for use in courses but also by improving the energy efficiency of their buildings.

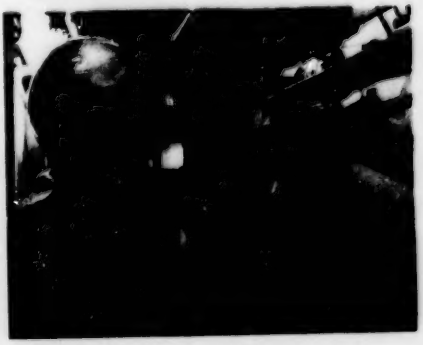
This computer and control centre at the University of Alberta will soon control the temperature and ventilation systems for all buildings on the campus.

In general, lighting levels have been adjusted, more efficient lighting has replaced incandescent, and heating and ventilating systems have been altered to more closely meet the heating demands. The installation of individual switches and thermostats permits local use of systems as needed. Futher, the universities have computer controlled their temperature and ventilation systems to operate only when the buildings are occupied.

Savings are significant. For example, at the University of Alberta, accumulated energy savings from 1975 through 1979 were $2.7 million. Funds have been approved for similar energy conservation programs at Alberta's ten community colleges. These are now under way. Advanced Education expects a 30% to 40% reduction in energy consumption at the universities and colleges.

Part of the program at universities and colleges has been the replacing of existing lighting with efficient fluorescent lamps.

Alberta Hospitals and Medical Care is also involved in a conservation program. New hospitals are designed to meet current international engineering standards as well as provincial energy efficient guidelines. Also, existing hospitals under renovation are incorporating energy conscious measures where feasible.



This control fitter at an Alberta hospital is working on the program to upgrade energy conservation standards in the province's hospitals.

The department is taking a leading role in the Federal/Provincial Task Force on Energy Management for Health Care Facilities in Canada.

Conservation programs have spread into other areas related to but not directly operated by government. Alberta Government Telephones, a public utility owned by the provincial government, is attempting to reduce energy consumption on a continuing basis through establishing performance targets.

AGT's new office building, currently under construction in Calgary, incorporates a number of conservation features. These include solar glazed reflective glass to reduce air conditioning loads, office zone lighting systems, above standard insulation and thermal storage tanks to allow recycling of waste heat.

New energy efficient Alberta Government Telephones building in Calgary.

In the transportation area, the company has tested small subcompact trucks, and has a number in operation in Calgary. It is converting to diesel fuel in trucks half-ton and over and is using compact automobiles where feasible. AGT employees with company vehicles are requested to observe a 90 km/h speed limit.

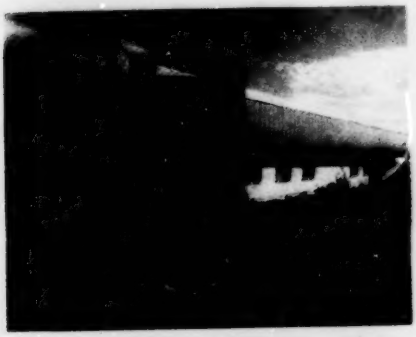
AGT is also conducting solar and wind energy research, with the main objective being to find different means of powering remotely located communications sites and more efficient ways to house batteries and communications equipment.

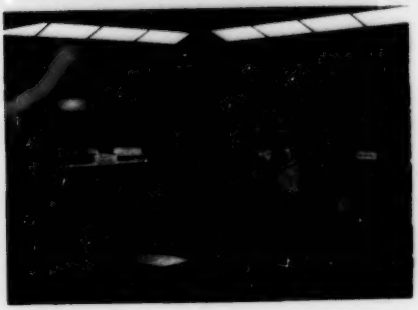
School buildings are another potential area for energy conservation. Alberta Education can encourage efficiencies through building grants. The department has a well developed energy conservation program based in part on the results of three major studies it funded.

The first, conducted at Grande Prairie, examined savings obtained through better operation and maintenance and without equipment or structural changes. Energy consumption was reduced at least 20% by such no-cost measures as lowering temperatures at night, reducing hot water temperatures, putting out lights in vacant rooms and so forth.

The second study, at Calgary, examined a range of modifications that could be made in schools. It found that major alterations, unless done in conjunction with repairs otherwise needed, were not cost effective. But less major changes

to heating and ventilating systems and lighting operations could reduce energy bills by at least 20%.





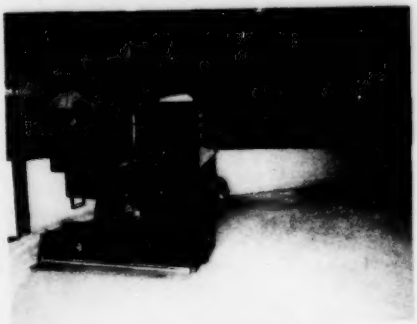
The Sweet Grass Elementary School in Edmonton will use less than half the energy of a normal school its size.

The third involved the design and construction of the Sweet Grass Elementary School. Data indicates that by planning with energy savings in mind (for example, placing the gym in the centre with the surrounding classrooms for insulation, limiting northern window exposures etc.), the energy bill can be cut in half.

The findings of these studies have been used to formulate a conservation manual, **Guidelines for Conserving Energy in Alberta Schools**, and will be further tested in 50 schools throughout Alberta. The department will be spending $1 million for consulting and equipment costs during the next two years. Besides the energy savings, this sample will help the department set realistic standards for energy use in schools by relating them to the type of building and its geographic location.

Likewise, Alberta Recreation and Parks, through its grant program, encourages conservation in the design and operation of recreation facilities in Alberta.

The department, in conjunction with gas and electric utility companies, has sponsored workshops for recreation facility managers about ways to increase energy efficiency in such areas as arena maintenance. Practical guides for the manager are available from the department.



Operating arenas more efficiently is one of the areas covered by Alberta Recreation and Parks consultants.

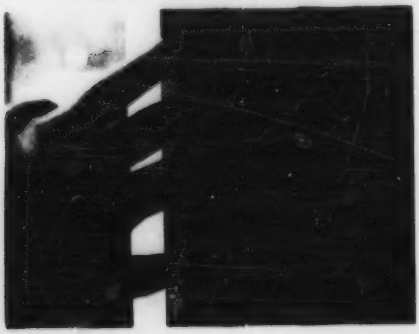
Workshops and consultations on energy management can be arranged through the Recreation Development Division.

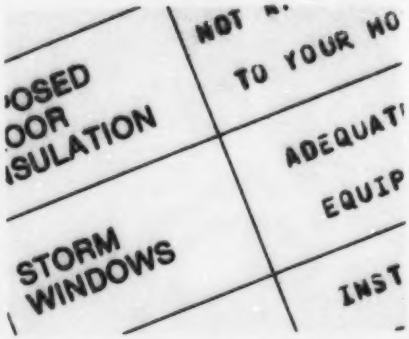
II By providing assistance and advisory programs.

As Alberta Recreation's program suggests, the government's energy conservation drive involves more than upgrading the efficiency of structures it owns or supports. Crucial are a number of advisory and assistance programs. These range from free energy audits to advisory programs and from seminars in energy management to data banks and publications.

In the residential field, Housing and Public Works, and Alberta Energy and Natural Resources co-operated with the federal government in promoting the **Enersave Home Energy Audit.**

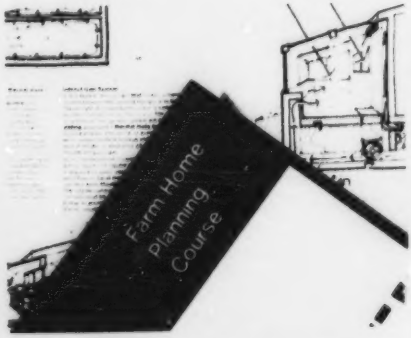
Through a reader service card enclosed with their electric utility bill, homeowners could obtain a home insulation questionnaire. Anyone taking the time to fill in information about the size of home, the insulation, the furnace and fuel bills received a personalized, computer analysis. The printout showed what modifications could be made, at what cost and for what energy savings. Potential savings on energy bills averaged 30%.





Weatherstripping windows and doors is one of the ways to save energy consumption in the home. The Enersave audit provided an analysis of what could be done in individual homes.

An energy analysis program is available through Alberta Agriculture for farm families. The Farm Home Planning Course with two options — New Home Planning and Construction or Remodelled Home Planning and Construction — is available. The extensive eight lesson package covers a variety of subjects including passive solar house design, and energy conservation techniques, materials and equipment.



Alberta Agriculture offers advice to farm families about energy efficient home and farm management.

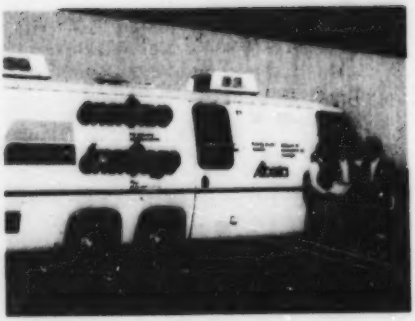
Advisory assistance is available for larger operations, too. The department helps secondary agriculture processing plants, for example, alfalfa dehydration operations — by offering advice and funding assistance for installing energy saving equipment.

Making use of waste heat from large manufacturing, gas compressor stations or electrical generating stations for greenhouse operations is being studied by the Horticultural Research Station at Brooks.

Alberta Agriculture initiated several demonstrations and research studies into energy efficiency and alternate energy uses. In a poultry broiler house at Tofield, an air-to-air exchanger is demonstrating how to recycle heat from exhaust air.

Poultry barn at Tofield utilizes heat from exhaust air. Techniques learned have applications in situations where high ventilation is needed to control humidity, and dust.

A permeable membrane ceiling in a dairy barn at Paradise Valley is being evaluated for energy recovery. A long-term project is underway to demonstrate possible energy-saving techniques in zero tillage.



Alberta's Enersave Bus contains equipment for an energy analysis of industrial and business operations. While it does not perform a comprehensive audit, the program is designed to make companies aware of areas of potential saving.

Industry and commerce account for well over one half of all the energy consumed in Alberta. To encourage and assist industry to improve its energy use efficiency, the Department of Economic Development is operating an industrial energy conservation program. The program is used to stimulate an awareness of energy use patterns at industrial plants and to identify the opportunities for energy conservation. The program is available to and directed at all industry in Alberta and is also used in the commercial and institutional sectors. The main operational part of the program

involves the use of an energy audit vehicle which visits industrial plants upon request. Engineers and technologists analyse the energy utilization at these plants and advise the plant management on the steps to be taken to improve energy efficiency. This is a free service for industry and the results are kept strictly confidential.

The Department of Economic Development is also participating in industrial energy conservation seminars and workshops and plans to develop a computer based technical information service for industry.

Another way the Alberta Government does promote energy efficiency is, of course, by regulation. Buildings funded through the Alberta Home Mortgage Corporation must meet insulation standards above the minimums in existing codes.

Alberta Transportation is working on fuel economy. Increased weight limits to 50,000 kg. on major highways allow commercial vehicles to move larger loads.

Use of triple trailer trucks on major highways encourages fuel efficiency.

The department is converting to the use of diesel engines in its trucks and is promoting the use of energy-efficient public transit.

Major funding assistance is being given to the Edmonton Light Rail Transit System and to its counterpart in Calgary currently under construction.

Alberta Municipal Affairs is reviewing property assessment legislation to uncover features in the tax structure which discourage investment in energy saving devices and improvements.

Municipal Affairs is exploring energy efficiency through better subdivision planning.

III By sponsoring research into more efficient and alternate energy uses.

Of course, efficient energy manage-

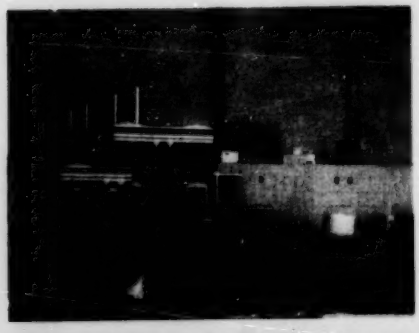
ment tomorrow requires research today. The Alberta Government's main research vehicle is the Alberta/Canada Energy Resources Research Fund (A/CERRF), managed by Energy and Natural Resources. The program finances projects undertaken by private industry, government departments and agencies, and the universities. A/CERRF was created as a result of the March, 1974, oil pricing agreement between the producing provinces and the federal government. Administered by a committee composed of Alberta and federal officials, the fund sponsors individual research projects on a year-by-year basis, many of which involve energy conservation. Some of the major projects that are related to energy conservation are:

1. District Heating Study: This project examined the feasibility of heating Edmonton's downtown core with waste heat from the Rossdale generating plant.
2. Alberta Housing and Public Works are studying the practicality and economic viability of thermally upgrading existing near flat roofs which have been membraned with a built-up asphaltic roofing system.
3. Solar and Wind Energy Research Program (SWERP). This program is administered by the Alberta Research Council. Solar and wind monitoring stations have been set up throughout the province to record radiation and wind levels. A library of technical information has been compiled and a computer-based search system makes the information available province-wide. Also, information packages have been provided to schools and to the general public.
4. Energy Efficient Housing Program: Alberta Energy and Natural Resources and the Housing and Urban Development Association of Canada (HUDAC) have been developing a program that will see two sets of energy efficient show homes in Edmonton and Calgary.

A variety of publications discussing solar and wind energy are available.

Monitoring equipment is being used throughout Alberta to record solar energy levels.

At this row of test housing units at the University of Alberta Farm, various solar techniques are applied and tested.



If the Rossdale Generating Plant in Edmonton were operated at full capacity during the winter months, excess thermal energy could heat Edmonton's downtown core.

5. Solar Heating in houses. A facility at the University of Alberta is used to test various energy conservation and active and passive solar heating techniques.

Energy Conservation Branch

The Energy Conservation Branch of Alberta Energy and Natural Resources co-ordinates programs on energy conservation and alternate energy conducted by all Alberta Government departments. It represents the province in energy conservation activities with the federal and other provincial governments and prepares education and information programs on energy conservation for the public.

The branch has developed liaison with other provincial departments and with the electric and natural gas utility companies, resulting in many jointly sponsored activities.

Publications on energy conservation are available from the Energy Conservation Branch.

Energy conservation displays have been prepared for the Calgary Stampede, the Edmonton Exhibition and the 1979 International Energy Conservation Month in October. The Alberta Energy Van, staffed by two teachers and equipped

with dislay and audio-visual equipment, will start visiting rural schools this fall.

The branch distributes material on energy conservation, including **The Fuel Economy Calculator and Log, Energy Matters, Solar Energy Matters** and **Energy Efficient Housing: A Prairie Approach** (a joint Saskatchewan/ Alberta project). A number of public information programs are currently under way with utility companies and other provincial governments.

SOURCE OF INFORMATION

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